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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,853	09/29/2006	Jiabing Wang	21492P	3712

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EXAMINER	
PIHONAK, SARAH	
ART UNIT	PAPER NUMBER
1617	
MAIL DATE	DELIVERY MODE
06/10/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,853	WANG ET AL.	
	Examiner	Art Unit	
	SARAH PIHONAK	1617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *3,4,12,13,17,18 and 22-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-11,14,15 and 19-21* is/are rejected.

7)☒ Claim(s) *16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/22/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

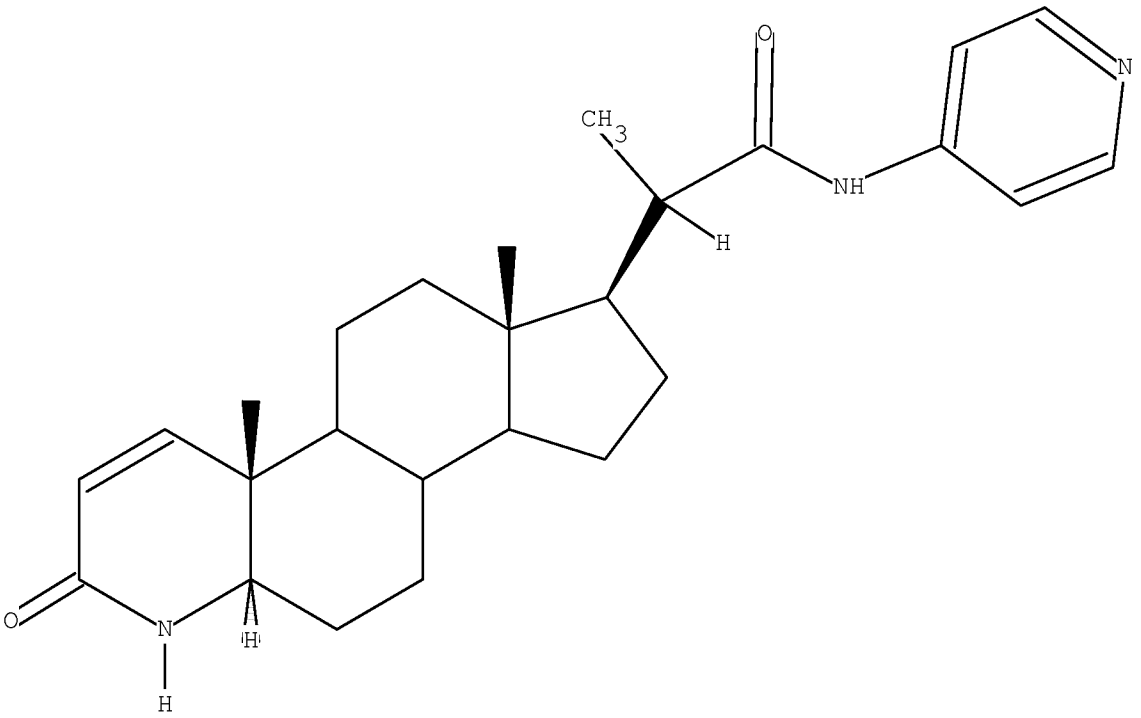
This application is a 371 (national stage application) of PCT/US05/11537, filed on 4/4/05.

Priority

This application was filed on 9/29/06, and claims priority to Provisional Application No. 60/560385, filed on 4/8/04. The provisional application provides support to the instant claims. Therefore, the effective filing date and priority date given to the instant claims is 4/8/04.

Response to Restriction Requirement

1. Applicant's election with traverse of the invention of Group I, claims 1-16, and 19-21 in the reply filed on 2/19/09 is acknowledged. The traversal is on the ground(s) that unity of invention between the different groups of inventions is present, as the compounds of Group I are novel. As such, the Applicants claim that the compounds of Group I are a special technical feature that is shared by Groups II & III. This is not found persuasive because not all of the compounds claimed in Group I are novel and non-obvious over the prior art. The US 5,710,275 patent discloses a compound of formula (I) as claimed by Group I (column 172, Table 7, compound 67). In particular, the compound disclosed by the US '275 patent shares the same steroid derivative backbone as the compounds of formula (I) claimed by Group I, and has the structure shown below:



The substituents of compound 67 as taught by the US '275 patent are correspond to formula (I) and are defined as follows: R^1=H, R^4=H, X=CH_3, Y=H, R^2=H, b=double bond, a=single bond, and R^3=$(CH_2)_n$-pyridinyl (heteroaryl), in which n=0. The only difference between the compound taught by the US '275 patent and the compounds cited in the instant application is that R^4 for compound 67 above is H; in the instant application, R^4=CH_3. However, the replacement of hydrogen for a methyl group would be routine and obvious for one of ordinary skill in the art, due to their structural similarity. Therefore, compound 67 as taught by the US '275 patent and the compound of formula (I) of the instant application are obvious variants of each other. As such, not all of the species of formula (I) of the instant application represent novel and non-obvious contributions over the prior art, and no longer represent a "special technical feature" as

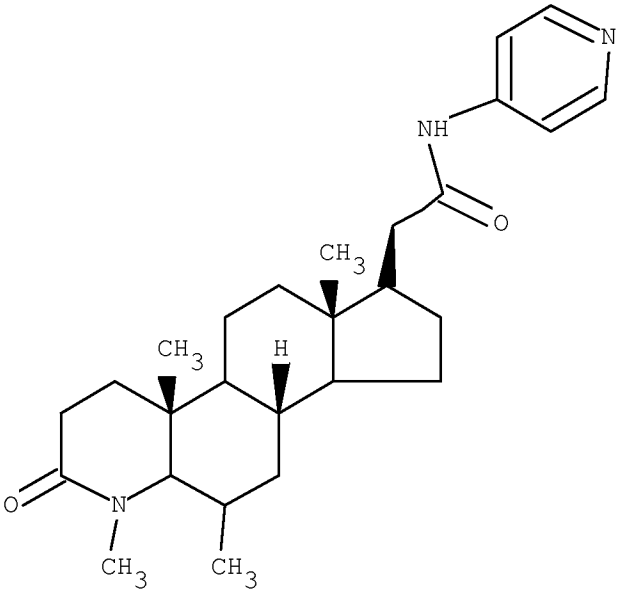
defined in PCT Rule 13.2. As all of the species of formula (I) do not represent a "special technical feature", unity of invention between Groups I-III does not exist.

In the reply filed on 2/19/09, Applicant's elected the species of formula (I) as N-(2-ethylpyridin-4-yl)-4-methyl-6-chloro-3-oxo-4-aza-5α-androst-5-en-17ß-acetamide, which is shown as Example 35, in Table 2, p. 58, of the instant specification. Applicant's also elected weakened muscle tone as the condition for treatment. However, this election for a condition for treatment only applies for the circumstance in which the invention of Group II was elected. As Group II was not elected by the Applicant, this species election regarding the condition of weakened muscle tone was not considered for examination of claims of Group I.

The requirement is still deemed proper and is therefore made FINAL.

The Applicant is also reminded that, in the event that the product claims are found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder.

2. Claims 17-18, and 22-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. The elected species of formula (I), N-(2-ethylpyridin-4-yl)-4-methyl-6-chloro-3-oxo-4-aza-5α-androst-5-en-17ß-acetamide, has been found to be free of the prior art. Therefore, an additional species of formula (I), N-(pyridin-4-yl)-4-methyl-6-methyl-3-oxo-4-aza-5α-androst-17ß-acetamide, has been examined for patentability. The structure of this species is shown below:



The substituents of the species shown above correspond to the general structure of formula (I) as follows: R^1=CH_3, R^2=H, R^3=(pyridin-4-yl), X=H, Y=H, a=single bond, b=single bond.

3. Claims 3-4 and 12-13 are also withdrawn from consideration, as they are drawn to non-elected species. For claims 3-4, R^3 is defined as an aryl group; the additional compound of formula (I) has a heteroaryl group in this position. Claims 11-12 also refer to the R^4 substituent as being selected from groups that do not include methyl; the R^4 substituent for the elected species is methyl. Applicant timely traversed the restriction (election) requirement in the reply filed on 2/19/09.

4. Claims 1-2, 5-11, 14-16, and 19-21 were examined.

5. Claims 1-2, 5-11, 14-15, and 19-21 are rejected.

6. Claim 16 is objected to.

Claim Rejections-35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

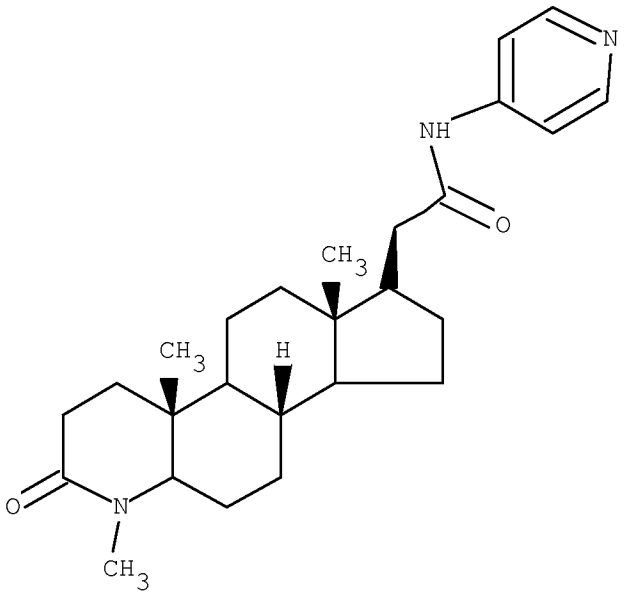
8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-2, 5-11, 14-15, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,693,809 patent, in view of the US 6,416,737 patent.

11. The US ‘809 patent discloses a compound, N-(pyridin-4-yl)-4-methyl-3-oxo-4-aza-5α-androst-17ß-acetamide (column 259, Table 9, compound 7). This compound, which will be referred to hereafter as 'compound 7', is shown below:



The substituents of compound 7, as taught by the US '809 patent, correspond to the structure of formula (I) as follows: R^1=CH_3, R^2=H, R^3=(pyridin-4-yl), R^4=H, X=H, Y=H, a=single bond, and b=single bond. The US '809 patent teaches that compound 7 and other compounds act as 5α-reductase inhibitors, which are useful in treating conditions associated with excess androgenic activity (column 1, lines 19-38, and column 2, lines 37-45). The US ‘809 patent also teaches that the compounds are present in a pharmaceutical composition, in a pharmaceutically acceptable carrier (column 272, lines 25-28, and column 273, lines 32-55).

Compound 7, as taught by the US ‘809 patent, and the species of formula (I) of the instant application, N-(pyridin-4-yl)-4-methyl-6-methyl-3-oxo-4-aza-5α-androst-17ß-acetamide, are nearly identical. The only difference between the two compounds is that

for compound 7, the R^4 substituent is H; for the instantly cited species of formula (I), R^4=CH_3. It is also known in the art that the substitution of a methyl group for hydrogen would be obvious, as they are considered homologues due to their structural similarity. Therefore, compound 7 of the US '809 patent and the instantly claimed species of formula (I), N-(pyridin-4-yl)-4-methyl-6-methyl-3-oxo-4-aza-5α-androst-17ß-acetamide, are obvious variants of each other, and one of ordinary skill in the art would have been motivated, at the time of the invention, to substitute a methyl group for hydrogen at the R^4 substituent of compound 7 to arrive at the instantly claimed species. The substitution of a methyl group for hydrogen on a known compound does not render the modification patentable, in the absence of unexpected or non-obvious results, *In re Lincoln*, 126 U.S.P.Q. 477, 53 U.S.P.Q. 40 (C.C.P.A. 1942); *In re Druey*, 319 F.2d 237, 138 U.S.P.Q. 39 (C.C.P.A. 1963); *In re Lohr*, 317 F.2d 388, 137 U.S.P.Q. 548 (C.C.P.A. 1963); *In re Hoehsema*, 399 F.2d 269, 158 U.S.P.Q. 598 (C.C.P.A. 1968); *In re Wood*, 582 F.2d 638, 199 U.S.P.Q. 137 (C.C.P.A. 1978); *In re Hoke*, 560 F.2d 436, 195 U.S.P.Q. 148 (C.C.P.A. 1977); *Ex parte Fauque*, 121 U.S.P.Q. 425 (P.O.B.A. 1954); *Ex parte Henkel*, 130 U.S.P.Q. 474, (P.O.B.A. 1960).

The US ‘809 patent does not explicitly teach that compound 7 and similar derivatives are combined with additional active agents, such as alendronate.

The US ‘514 patent teaches that bone loss can be reduced with 5α-reductase enzyme inhibition (column 2, lines 32-36). The US ‘514 patent also teaches that alendronate is effective in reducing bone loss by inhibiting bone resorption (column 143, lines 37-50).

Compound 7 is taught by the US '809 patent as capable of inhibiting 5α-reductase activity (column 259, Table 9, compound 7, and column 2, lines 37-45). The instantly claimed species, N-(pyridin-4-yl)-4-methyl-6-methyl-3-oxo-4-aza-5α-androst-17ß-acetamide, also possesses this property. The US '514 patent teaches that 5α-reductase enzyme inhibition reduces bone loss (column 2, lines 32-36). Therefore, as compound 7 and the instantly claimed species inhibit 5α-reductase enzyme activity, compound 7and the instantly cited methyl analog species would also be expected to be useful for reducing bone loss. The US '514 patent also teaches that alendronate is effective in decreasing bone loss (column 143, lines 37-50). Therefore, one of ordinary skill in the art would have been motivated to combine compound 7 and the instantly claimed methyl analog with alendronate in a composition, as both active agents function in minimizing bone loss. It would have been obvious to combine both agents with an expectation of success, as they both function to reduce bone loss. Therefore, it would have been prima facie obvious for one of ordinary skill in the art at the time of the invention to combine compound 7 or the instantly claimed methyl analog, N-(pyridin-4-yl)-4-methyl-6-methyl-3-oxo-4-aza-5α-androst-17ß-acetamide, with alendronate, as the US '809 patent teaches that compound 7 reduces 5α-reductase enzyme activity, and the US '514 patent teaches that 5α-reductase inhibitors and alendronate both function to minimize bone loss.

Claim Rejections-Obviousness Type Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

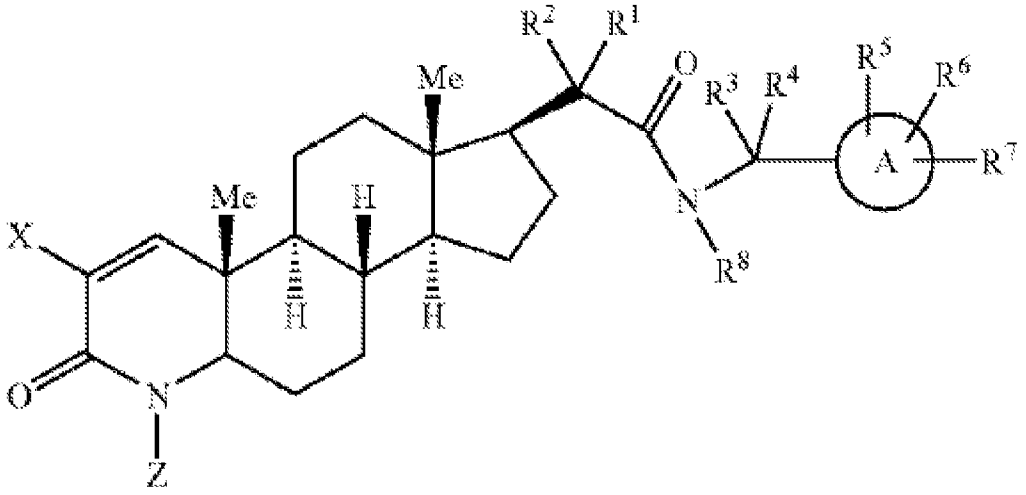
A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-2, and 5-8 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 7,482,357. Although the conflicting claims are not identical, they are not patentably distinct from each other because the compounds claimed in the instant application and the US 7,482,357 patent are obvious variants of each other.

14. The instant application cites compounds of formula (I), which share the same backbone as the compounds cited by claim 1 of the US '357 patent. The compounds of formula I claimed by the US '357 patent are shown below:

I



For compounds of formula I above, X=H or halogen; Z=hydrogen, C $_{1\text{-}3}$ alkyl, etc.; R^1=H, halogen, hydroxyl, etc.; R^2= H, halogen, hydroxyl, etc.; R^8=hydrogen, etc.; R^3=hydrogen, etc.; R^4=hydrogen, etc.; A=pydinyl or quinolyl, R^5-R^7=H, etc. These compounds overlap with the instantly claimed compounds of formula (I), as for formula (I), R^3=$(CH_2)_n$-heteroaryl, in which n=1-2; R^2=H; X=H; Y=H; R^1=H or CH_3; a= single bond; b=double bond. The only difference between the corresponding compounds disclosed in claim 1 of the US '357 patent and the instant compounds of formula (I) is that, for formula (I), R^4=CH_3, etc. This position is occupied by a hydrogen for formula I compounds disclosed by the US '357 patent. However, the substitution of a methyl as the R^4 substituent over hydrogen would have been obvious to one of ordinary skill in the

art, as the groups are considered homologues, due to their structural similarity. Therefore, the compounds disclosed in claim 1 of the US '357 patent and the instant claims 1-2, and 5-8 overlap and are obvious variants of each other.

Claim Rejections-Obviousness Type Provisional Double Patenting

15. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

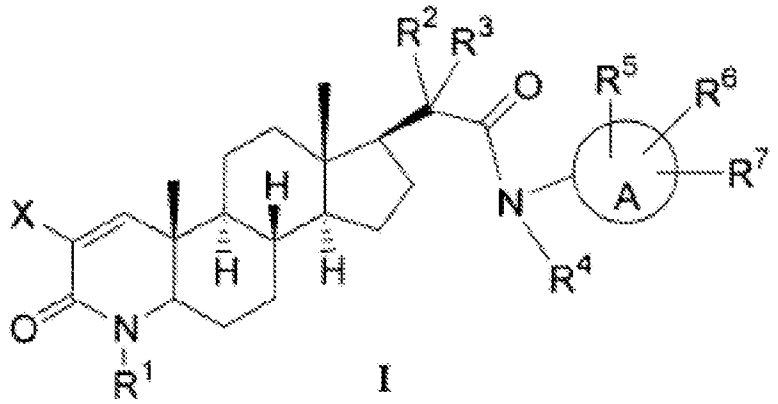
A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

16. Claims 1-2, and 5-8 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 7, and 9-11 of copending Application No. 10/557229. Although the conflicting claims are not identical, they are not patentably distinct from each other because species of compounds of formula I cited by the copending application are obvious variants of compounds cited in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

17. The instant application cites compounds of formula (I) which share the same carbon backbone as compounds of formula I disclosed by the copending application No. 10/557229. The structure of formula I as disclosed by the instant application is shown below:



I

The substituents of formula I which correspond to that of the instantly cited formula (I) are as follows: R^1=H, C_{1-3} alkyl, etc.; R^2=H, halogen, etc.; R^3=H, halogen, etc.; R^4=H, etc.; R^5-R^7=H, halogen, etc.; A=pyridinyl; X=hydrogen, etc. For compounds of the instantly cited formula (I), A=pyridinyl; R^1=H or CH_3; X=H; R^2=H; R^3=H; and R^5-R^7=H, halogen, etc. The only difference between compounds of formula I as disclosed in the copending application and compounds of formula (I) in the instant application is that the R^4 substituent in the instantly cited application is occupied by a methyl or another substituent. This corresponding position is occupied by hydrogen for formula I.

However, the replacement of hydrogen for a methyl group would have been routine and obvious for one of ordinary skill in the art, as the groups are structurally similar to each other. As such, the compounds claimed by the copending application of formula I and of formula (I) of the instant application are obvious variants of each other.

Claim Objections

18. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

19. Claim 21 is objected to because of the following informalities: the claim refers to being a dependent claim of itself. Claim 21 cites "A composition of claim 21…". For purposes of determining patentability of the claim, claim 21 was interpreted as being a dependent claim of claim 19. Appropriate correction is required.

Information Disclosure Statements

20. The information disclosure statement (IDS) submitted on 12/22/06 was filed. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH PIHONAK whose telephone number is (571)270-7710. The examiner can normally be reached on Monday-Thursday 8:00 AM - 6:30 PM EST, with Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sreeni Padmanabhan can be reached on (571)272-0629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

S.P.

/SREENI PADMANABHAN/

Supervisory Patent Examiner, Art Unit 1617